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From: Robert Shewmaker
To: BHW; DTH; MJS3; RWP
Date: 10/9/02 10:29AM
Subject: BACKGROUND AIRCRAFT DATA ON PURDUE PENTAGON STUDY

I compiled the attached information from data I have been able to obtain from the Purdue team working on the crash simulation for a Boeing 757-200 airliner.

The distribution percentages may be of use to us for some reality checks on the SNL model efforts.

CC: EXE; JXG; MWH

D/10

BOEING AIRCRAFT INFORMATION
Used by PURDUE STUDY TEAM
For PENTAGON ATTACK SIMULATIONS

This information was used to model the Boeing 757-200 commercial aircraft that crashed into the Pentagon on 9/11/01.

The information provided below is based on a personal communication with Dr. Mete Sozen, Project Leader, who was also on the official BPS Study Team for the Pentagon Attack of 9/11/01. Model used was only a representation of one wing.

1. The team was able to get a representative cross-section of the fuselage from Boeing but Sozen did not indicate the level of detail of that section.

2. They used aluminum for the shell, apparently with the LS-DYNA embedded "AL" properties.

3. Total aircraft weight at impact: 181,500 lbs or 71.2% of max. permissible takeoff weight

4. Total fuel on-board at impact: 5,325 gals or 36,200 lbs or 46.4% of the max fuel capacity

5. Distribution of fuel at impact: 20% to center tank and 40% to each wing tank

6. Distribution of mass of wing at impact:
   27.2% - engine and strut
   8.7% - landing gear
   30.8% - wing structure and tank shell
   33.3% - fuel

7. Distribution of mass of fuselage at impact:
   XXXX - landing gear
   XXXX - fuselage and tank shell
   XXXX - passengers & crew (64 total). If taken at an average of 200 lbs/person this would be 13.6% for this study.
   XXXX - baggage
   7.5% - fuel

8. The mass of the engine and strut was distributed within the wing finite elements

9. Landing gear assembly omitted from wing model, apparently meaning the mass or rigidity at the location was omitted from the wing model.

(Note that the study did not model the fuselage since the analysis focused on the interaction of the wing and the building columns.)

FILE:BOEINGsozenSTUDY